CLAIMS

1. Device for measuring the contrast of fringes in a full-field Michelson interferometer comprising at least one reference arm and one measurement arm co-operating with a detection arm in order to produce an optical coherence tomography (OCT) system, the device comprising in its detection arm means of deflecting two incoming perpendicular polarizations in two different emerging directions.

2. Device according to claim 1, characterized in that the means of deflection comprise a Wollaston prism.

3. Device according to claim 2, characterized in that it is arranged to carry out measurements for path differences differing by $\lambda/2$ or $\lambda/4$.

4. Device according to claim 3, characterized in that it is arranged so as to obtain at least two measurements, strictly simultaneous and in phase opposition.

5. Device according to one of claims 2 to 4, characterized in that it is arranged in order to carry out four measurements, and in that it also comprises means to separate a beam entering into the detection arm into at least two separate beams, means of generating, in one of these two beams, an additional delay of $\lambda/4$ between the polarizations originating from the measurement arm and the reference arm of the interferometer, and means of reintroducing the two beams thus processed into the Wollaston prism such that, on output from the latter, there are then four light beams.

6. Device according to claim 5, characterized in that the separator means comprise a single non-polarizing separator plate (BSP/M).

7. Device according to one of claims 5 or 6, characterized in that the delaying means comprise a quarter-wave plate (QOP/M).

8. Device according to one of claims 5 to 7, characterized in that the Wollaston prism (W) is arranged in a pupil plane.

9. Device according to one of claims 5 to 8, characterized in that it also comprises means to arbitrarily orient the polarizations of four incident beams relative to the Wollaston prism's (W) own axes.

10. Device according to claim 9, characterized in that the means of orientation comprise a half-wave plate (DOP/M) preceding the Wollaston prism (W).

11. Method for measuring the contrast of fringes in a full-field Michelson interferometer comprising at least one reference arm and one measurement arm co-operating with a detection arm so as to produce an optical coherence tomography (OCT) system, the method comprising a deflection of two incoming perpendicular polarizations in two different emerging directions, by means of a Wollaston prism (W) situated in said detection arm.

12. Method according to claim 11, characterized in that it comprises measurements for path differences differing by $\lambda/2$ or $\lambda/4$.

13. Method according to claim 12, characterized in that it comprises at least two measurements, strictly simultaneous and in phase opposition.

14. Method according to one of claims 11 to 13, characterized in that it comprises four measurements, a separation into two of a beam entering the detection arm, a generation, in one of the two beams produced, of an additional delay of $\lambda/4$ between the polarizations originating from the measurement arm and the reference arm of the interferometer, and a reintroduction of the two beams thus processed into the Wollaston prism such that, on output from the latter, there are then four light beams.

15. Method according to claim 14, characterized in that it also comprises an arbitrary orientation of the polarizations of the four incident beams relative to the Wollaston prism's own axes.

16. Method according to claim 15, characterized in that the measurements on the four beams are carried out simultaneously.

17. Method according to one of claims 1 to 16, characterized in that it comprises, in the measurement arm, a compensation for the effects of focal chromatism of the eye.

18. Method according to one of claims 1 to 17, characterized in that it comprises, in the reference arm, means for compensating for the dispersion of the path differences.

19. Method according to one of claims 1 to 18, characterized in that it comprises a control of the wavefront analyser (SH) obliging it to work in defocussed mode.

20. System for examining the eye by *in vivo* tomography, comprising:
- a Michelson interferometer, comprising at least one measurement arm and one reference arm co-operating with a detection arm in order to produce a full-field OCT setup,
- adaptive optical means, arranged between the measurement arm of the interferometer and an eye to be examined or within said measurement arm, carrying out the correction of the wavefronts originating from the eye as well as those reaching the eye, and
- means of detection, arranged downstream of the interferometer or within its detection arm, making it possible to carry out the interferometric measurement according to the optical coherence tomography (OCT) principle,

characterized in that it also comprises a device for measuring the contrast of fringes in a full-field Michelson interferometer, this device comprising in the

detection arm means for deflecting two incoming polarizations in two different emerging directions.

21. System for examining the eye according to claim 20, characterized in that it also comprises a sighting device comprising at least one moving target having a programmable shape and trajectory, said target being displayed on an appropriate screen, visible by both eyes, during the examination period.

22. System according to one of claims 20 or 21, characterized in that the reference source (SLD) is inserted into the optical path between the adaptive optical means (MD) and the eye to be examined (OEX).

23. System according to one of claims 20 to 22, characterized in that it comprises, in the measurement arm, means for compensating for the effects of focal chromatism of the eye.

24. System according to one of claims 20 to 23, characterized in that it comprises, in the reference arm, means for compensating for the dispersion of the path differences.